2 Docket No.: 09871/0200096-US0

Application No. 10/676,327 Preliminary Amendment dated July 20, 2007

AMENDMENTS TO THE CLAIMS

(Currently amended) An electric syringe for injecting a dental anesthetic by pressing a rubber
plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint of a

dental needle connected to the cartridge, the electric syringe comprising:

a push member configured to press and move the rubber plug of the cartridge;

a drive motor configured to generate a drive force;

a transmission mechanism part configured to transmit the drive force to the push member; and

a control unit configured to control a moving of the push member by controlling the drive

motor,

wherein the control unit controls the drive motor to move the push member to [[gradually]]

linearly increase an injection speed of the anesthetic at a constant, predetermined rate at [[in]] the

beginning of the injection and until reaching a selected injection speed, and then to move the push

member to inject the anesthetic at the selected in a constant injection speed without further increase

after a predetermined time has elapsed.

2. (Original) The electric syringe as claimed in claim 1 further comprising a sound output unit

configured to output a sound,

wherein the control unit controls the sound output unit to output the sound during the injection

of the anesthetic.

3. (Original) The electric syringe as claimed in claim 1 further comprising an operation switch

having a window hole portion and a sensor of a light reflection type in which detects whether or not

the window hole portion is closed.

Preliminary Amendment dated July 20, 2007

wherein the control unit starts the injection of the anesthetic when the sensor of the operation switch detects that the window hole portion is closed.

3

(Original) The electric syringe as claimed in claim 3, wherein the operation switch comprises:

a first operation switch having a first window hole portion configured to be closed by a hand gripping the electric syringe, and a first sensor of a light reflection type in which detects whether or

not the first window hole portion is closed; and

a second operation switch having a second window hole portion configured to be closed by a finger, and a second sensor of a light reflection type in which detects whether or not the second window hole portion is closed, and

wherein the control unit starts the injection of the anesthetic when both of the first and the second window hole portions are detected by the first and the second sensor to be closed.

5. (Original) The electric syringe as claimed in claim 1, wherein the transmission mechanism part comprises:

a lock removing button arranged on a cover case of the electric syringe; and

a clutch mechanism portion configured to release the transmission of the drive force when the lock removing button is operated.

6. (Original) The electric syringe as claimed in claim 5 further comprising:

a cartridge holder connecting part; and

a cartridge holder configured to hold the cartridge and configured to be connectable to the cartridge holder connecting part.

Application No. 10/676,327 4 Docket No.: 09871/0200096-US0 Preliminary Amendment dated July 20, 2007

7. (Original) The electric syringe as claimed in claim 6, wherein the cartridge holder is

configured to hold each one of a plurality of cartridges having different lengths, and configured to be

connectable to the cartridge holder connecting part.

8. (Original) The electric syringe as claimed in claim 7, wherein the cartridge holder is

configured to hold each one of a first cartridge filled with 1.0 ml of the anesthetic and a second

cartridge filled with 1.8 ml of the anesthetic.

9. (Original) The electric syringe as claimed in claim 6, wherein the lock removing button is

configured to be operated in accordance with the connection of the cartridge holder to the cartridge

holder connecting part.

10. (Original) The electric syringe as claimed in claim 6 further comprising a biasing member

configured to apply a biasing force to the push member,

wherein the push member is configured to move in a state contacted with the rubber plug of

the cartridge in accordance with the connection of the cartridge holder to the cartridge holder

connecting part, and

wherein the push member is configured to be in contact with the rubber plug at a constant

pressure by the biasing force applied by the biasing member when the cartridge holder is connected to

the cartridge holder connecting part.

11. (Original) The electric syringe as claimed in claim 1 further comprising:

a cartridge holder connecting part; and

Application No. 10/676,327 5 Docket No.: 09871/0200096-US0 Preliminary Amendment dated July 20, 2007

a cartridge holder configured to hold the cartridge and configured to be connectable to the

cartridge holder connecting part.

12. (Previously presented) The electric syringe as claimed in claim 11, wherein the cartridge

holder is configured to hold one of a plurality of cartridges having different lengths, and configured to

be connectable to the cartridge holder connecting part.

13. (Previously presented) The electric syringe as claimed in claim 12, wherein the cartridge

holder is configured to hold one of a first cartridge filled with 1.0 ml of the anesthetic and a second

cartridge filled with 1.8 ml of the anesthetic.

14. (Original) The electric syringe as claimed in claim 1, further comprising a cartridge holder

connecting part configured to be connected with a cartridge holder configured to hold the cartridge

and having a groove on an outer peripheral surface thereof,

wherein the cartridge holder connecting part comprises:

a connecting ring having a tube body formed in a rotary body shape;

a ball pusher biasing member arranged in the tube body of the connecting ring;

a ball pusher arranged in the tube body of the connecting ring, applied with a biasing force by

the ball pusher biasing member in the opposite direction to a connection direction of the cartridge

holder, and formed in a cylindrical body shape having a multi-stage-shaped outer peripheral surface;

a mounting and removing ring biasing member arranged outside of the tube body of the

connecting ring;

a mounting and removing ring arranged outside the tube body of the connecting ring, applied

with a biasing force by the mounting and removing ring biasing member in the opposite direction to

Application No. 10/676,327 6 Docket No.: 09871/0200096-US0 Preliminary Amendment dated July 20, 2007

the connection direction of the cartridge holder, and formed in a cylindrical body shape having an

inner peripheral surface with a groove;

a first ball arranged in the connecting ring in a manner to be movable between the multi-stage-

shaped outer peripheral surface of the ball pusher and the grooved inner peripheral surface of the

mounting and removing ring; and

a second ball arranged in the connecting ring in a manner to be movable between the grooved

outer peripheral surface of the cartridge holder and the grooved inner peripheral surface of the

mounting and removing ring,

wherein when the cartridge holder is connected, the cartridge holder presses against the ball

pusher and thus the cartridge holder and the ball pusher are moved in linking with each other to

thereby move the first ball to the ball pusher side and the second ball to the cartridge holder side, and

wherein when the cartridge holder is connected, the mounting and removing ring released

from the movement restraint by the first ball is moved in the opposite direction to the cartridge

insertion direction to press against the first and second balls, thereby connecting the cartridge holder

to the cartridge holder connecting part.

15. (Currently amended) An electric syringe for injecting a dental anesthetic by pressing a rubber

plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint of a

dental needle connected to the cartridge, the electric syringe comprising:

a push member configured to press and move the rubber plug of the cartridge;

a drive motor configured to generate a drive force;

a transmission mechanism part configured to transmit the drive force to the push member;

Docket No.: 09871/0200096-US0

Application No. 10/676,327 Preliminary Amendment dated July 20, 2007

a control unit configured to control a moving of the push member by controlling the drive

7

motor.

wherein the control unit controls the drive motor to move the push member to [[gradually]]

linearly increase an injection speed of the anesthetic at a constant, predetermined rate at [[in]] the

beginning of the injection and until reaching a selected injection speed, and then to move the push

member to inject the anesthetic at the selected in-a constant injection speed without further increase

after-a-predetermined time-has elapsed; and

a sound output unit configured to output a buzzing or melodic sound.

wherein the control unit controls the sound output unit to output the sound during the injection

of the anesthetic.

16. (Previously presented) The electric syringe as claimed in claim I further comprising:

a cartridge holder connecting part; and

a cartridge holder configured to hold one of a plurality of cartridges having different lengths.

and configured to be connectable to the cartridge holder connecting part.

17. (Previously presented) The electric syringe as claimed in claim 16, wherein the cartridge

holder is configured to hold one of a first cartridge filled with 1.0 ml of the anesthetic and a second

cartridge filled with 1.8 ml of the anesthetic.

18. (Previously presented) An electric syringe for injecting a dental anesthetic by pressing a

rubber plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint

of a dental needle connected to the cartridge, the electric syringe comprising:

a push member configured to press and move the rubber plug of the cartridge;

Application No. 10/676,327 8 Docket No.: 09871/0200096-US0 Preliminary Amendment dated July 20, 2007

a drive motor configured to generate a drive force;

a transmission mechanism part configured to transmit the drive force to the push member:

a control unit configured to control a moving of the push member by controlling the drive

motor.

wherein the control unit controls the drive motor to move the push member to gradually

increase an injection speed of the anesthetic in the beginning of the injection and to move the push

member to inject the anesthetic in a constant injection speed after a predetermined time has elapsed:

and

an operation switch having a window hole portion and a sensor of a light reflection type in

which detects whether or not the window hole portion is closed,

wherein the control unit starts the injection of the anesthetic when the sensor of the operation

switch detects that the window hole portion is closed.

19. (Previously presented) An electric syringe for injecting a dental anesthetic by pressing a

rubber plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint

of a dental needle connected to the cartridge, the electric syringe comprising;

a push member configured to press and move the rubber plug of the cartridge:

a drive motor configured to generate a drive force;

a transmission mechanism part configured to transmit the drive force to the push member,

comprising:

a lock removing button arranged on a cover case of the electric syringe; and

Application No. 10/676,327 9 Docket No.: 09871/0200096-US0 Preliminary Amendment dated July 20, 2007

a clutch mechanism portion configured to release the transmission of the drive force when the

lock removing button is operated; and

a control unit configured to control a moving of the push member by controlling the drive

motor.

wherein the control unit controls the drive motor to move the push member to gradually

increase an injection speed of the anesthetic in the beginning of the injection and to move the push

member to inject the anesthetic in a constant injection speed after a predetermined time has elapsed.

20. (New) The electric syringe as claimed in claim 1, wherein the control unit controls the drive

motor to move the push member to reach a selected one of a plurality of selectable injection speeds by

linearly increasing the injection speed of the anesthetic at the constant, predetermined rate at the

beginning of the injection and until reaching the selected injection speed.

21. (New) The electric syringe as claimed in claim 1, wherein the constant, predetermined rate is

about 0.00087 mL/sec2.

22. (New) The electric syringe as claimed in claim 20, wherein the plurality of selectable

injection speeds includes speeds of 0.005 mL/sec, 0.011 mL/sec and 0.016 mL/sec.